

# greening THE FUTURE



As job growth in the green economy outpaces total job growth, schools are preparing students for a greener tomorrow.

**B**ecause we educators vicariously touch the future through our students, I believe that we sometimes have the uncanny ability to see the future. One common future forecast is the phenomenal growth of green jobs in the emerging green economy, leading to our creation of the “Reach for the Sun” Solar Energy Academy at La Mirada High School.

Manufacturing employment in California’s green economy expanded by 19 percent from 1995 to 2008, according to Reuters, while there was a 9 percent drop in total manufacturing employment over the same period. The engine driving this burgeoning growth of the green marketplace is fueled by research that describes formidable challenges for California and its economy. We need to help prepare our students for the seismic changes in society and our environment.

La Mirada High School, under the leadership of Principal Bill Seals and District Superintendent Ruth Perez, has a history of green grant awards. In 2004, I wrote the

first grant application (a \$10,000 award) to British Petroleum “A+ for Energy” funding. Realizing that the foreign language curriculum, which I teach, could not do justice to the breadth and scope of the renewable energy field, I invited science teachers to join the BP funded, “Wave of the Future” energy program.

A total of seven individual \$10,000 grants, for a total of \$70,000, were consequently awarded from 2004 to 2008 to La Mirada High’s initial energy program. Funds were used for classroom materials, solar technology, fieldtrips, conferences, literature and other student related expenses.

From the many students who participated in “Wave of the Future” energy program, several went on to environmental studies majors and internships in solar installation businesses.

Because our funding is so dependent on grant monies, we have begun to model grant

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*By Norma Velia Williamson*

writing for students and direct them to grant opportunities. A couple years ago, I guided a student in the writing of a mini-grant to replace Styrofoam lunch trays at school with more eco-friendly bio-plastic trays made from corn starch. She won \$500 to accomplish this goal!

In 2009, La Mirada High School was awarded a Green CPA (California Partnership Academy) three-year grant for a “Reach for the Sun, Solar Energy Academy.” For the first time in 2009, California Department of Education awarded up to \$42,000 CPA grants to 42 high schools across the state to develop and implement green academies that focus on clean technology and energy businesses.

### **Alternative energy school within a school**

The California Partnership Academies are small learning communities based on a “school within a school” model. Core classes revolve around a career tech program, in this case a newly developed Green Construction/Alternative Energy class in the school’s woodshop. As mandated by the state, 50 percent of academy students must meet the at-risk criteria of low motivation, low GPA, high absenteeism, and economically disadvantaged.

Students as well as teachers are required to volunteer to participate in the academy. Teacher-developed curriculum is integrated into main courses of study. Tenth-grade core academy classes are: language arts, world history, biology and green construction/alternative energy. Eleventh-grade classes are language arts, U.S. history and Spanish. Additional academy classes are algebra I and geometry. In spite of the normal “growing pains” of a second year program, we do have much to celebrate and to share!

Teachers receive in-service on implementing the Buck Institute approach to Project Based Learning. This instructional, standards-based methodology empowers students as active learners, connects them to the real world of work and challenges them to solve authentic problems by conducting inquiry around a “driving question.”

For example, a current U.S. history four-week unit organized its inquiry-based learning around the driving question: “How does

a residential building become a net zero energy home and how can these green homes attract a buyers’ market?” The “entry event,” which is intended to motivate and engage students’ curiosity, was a field trip to Traditions Heritage Springs, a new solar home development in Santa Fe Springs, Calif.

A representative from Sun Power (a solar

Pomona Regenerative Center, a 16-acre community model dedicated to the principles of environmentally sustainable living with demonstrations of straw bale buildings, solar energy, water reclamation, water purification and organic gardening.

In the language arts classroom, students hear from a freelance writer about strategies



**Eleventh-grade students at La Mirada High School measure thin solar film to determine whether it can be used to power a school golf cart.**

company) personally introduced students to residential solar systems and the Far West Industries project superintendent described the energy efficient features of the homes. Students were amazed to hear that a recent electric bill of one of the solar homes was a grand total of 72 cents!

This U.S. history unit is integrated with language arts and foreign language. Students are challenged to “green” the nation’s first housing development for World War II veterans – Levittown, in Long Island – by simulating green energy upgrades through constructing table top shoebox solar homes with functional mini solar panels.

In U.S. history class, students learn about the green careers needed to renovate the old energy-wasteful veterans’ housing. Students also engage in a Green Energy Jobs Search classroom activity, as well as host special classroom speakers like Anna Bautista from GRID Alternatives, who is one of 10 female solar installers in the country.

A third fieldtrip will be to the Cal Poly

for effective writing of promotional materials and create a sales brochure for the energy upgrades of a veterans’ housing development. A variety of rubrics will help assess the projects’ culminating products: the solar homes sales brochure, the solar homes shoebox models, the “Greening of WW II Veterans’ Housing” student-made PowerPoint presentations.

### **Community partners offer motivation**

The CTE Green Construction/Alternative Energy class constructed wooden table-top solar house models, which included blue jean insulation, mock dual pane windows and a fully functional solar panel that operates a miniature fan. Local solar homeowners will be invited to visit classrooms and give positive feedback to students’ PowerPoint presentations and products.

Eleventh-grade solar academy students were prepared for this U.S. history unit on net zero energy homes from their tenth-grade green curriculum research project in

language arts and biology. The project examined how global societies can reduce their carbon dioxide emissions.

In addition to the research paper and student-made scrapbooks on this carbon dioxide emissions instructional ecology unit, a culminating project for current tenth and eleventh graders will be “solarizing” a school service electric golf cart. Academy community partner Bob Siebert, founder of EE Solar, will guide students in installing solar panels on the golf cart’s roof canopy.

A school-wide event that complements this carbon dioxide unit is the yearly competition with a local “rival” high school, Norwalk High, in the sixth annual “Bike, Walk to School Day,” which recognizes the high school that reduces carbon dioxide emissions the most.

For the second year, the Solar Energy Academy has kicked off the academic year by hosting its annual Solar Job Fair. The purpose of this event is to expose new academy students to information related to renewable energy, energy efficiency and other envi-

ronmental topics in order to raise student awareness and motivation.

Community partners of the solar academy exhibit their green information and older academy students display fun, interactive displays. Students visit each “booth” and take notes about the exhibits.

### A sampling of our best practices

Green fundraisers, like Green Irene and Green Tree Footprints, not only help raise funds for fieldtrips, but are educational as well. The products are eco-friendly and promote environmental awareness, from energy-efficient light bulbs to recycled wrapping paper.

This year a Reforestation fundraiser complements the Amazon rainforest unit in our Spanish Two curriculum. We keep 66 percent of the profit, and proceeds go to replanting trees in National Forests. Our fundraiser will be sponsoring the reforestation of the Angeles National Forest that suffered from the burning of 166,000 acres in September 2009.

Forget gold stars. We motivate and reward students by allowing them to bake their favorite snacks in our academy’s professionally manufactured solar oven. This is a well insulated, portable black box, with reflective wings that open up and a door lid that traps solar thermal energy in the oven’s interior while it bakes food items. Students set up the oven and prepare food ingredients during snack or lunch. After a couple hours of sunshine, hard-working students are rewarded with delicious, solar-baked goodies.

Norwalk La Mirada’s district Director of Facilities Planning and Construction Isela Vazquez is currently exploring the possibility of solarizing La Mirada High School at no upfront cost. This could provide an opportunity to use 12th grade green solar academy students in the design and installation of the system in a capstone class next academic year.

### Connecting practice with principles

California Partnership Academies aim to connect practice with academic principles, hands-on career tech with core curriculum and, finally, student engagement with academic rigor.

Concurrently, GREEN CPAs will help California meet the aggressive greenhouse gas reduction targets of AB 32, the 2006 landmark legislation titled: “Global Warming Solutions Act,” by educating students about the benefits of clean, green energy technologies and preparing them to join the green labor force. This will ultimately help stabilize our climate and make our California economy No. 1.

Our Solar Energy Academy ascribes to the belief that kinesthetic, hands-on technical learners (vocational students) can attend post-secondary education and be successful. The future is in the hands of California educators. Let’s continue to promote energy efficiency concepts through greening our lives, our curriculum and the state’s economy, thereby preserving the beauty of planet earth for future generations! ■

*Norma Velia Williamson is teacher/coordinator for the “Reach for the Sun” Solar Energy Academy, La Mirada High School.*

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